CHAPTER 19

Dizziness

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Dizziness is one of the most common and difficult symptoms to address in the primary care setting. Often the complaint is vague and is extremely subjective from the perspective of the patient. Dizziness may describe everything from feeling faint or lightheaded to feeling weak or unsteady. The workup of this symptom involves considering simple and complex medical illnesses and the list of possible etiologies is vast.

Because dizziness may be used to describe many different sensations, it is imperative that physicians have an exact idea of what is meant by the patient. For example, lightheadedness should be distinguished from vertigo. Lightheadedness may suggest a low blood flow state to the brain, whereas vertigo suggests an inner ear or cerebellar dysfunction. Obtaining an accurate history is a crucial step and allows the physician to work through the different possible causes. This section highlights the most common causes of dizziness: positional vertigo, atherosclerotic vascular disease, cardiac causes, stroke and transient ischemic attacks (TIAs), medications, and anxiety.

LIGHTHEADEDNESS

There are many causes for global hypoperfusion of the brain which may be transient or persistent.

VASOVAGAL EPISODES

Vasovagal episodes are a type of noncardiac syncope usually precipitated by pain, fear, or stress (emotional). These events are most often recurrent and are a reaction to a specific trigger. Younger individuals are more often affected although they may be experienced by individuals of any age. A prodrome, consisting of nausea, vision changes, diaphoresis, and abdominal and chest discomfort, may occur prior to losing consciousness. Treatment of vasovagal episodes is identification and avoidance of certain triggers. Unlike other forms of cardiogenic syncope, vasovagal syncope is benign and is not life threatening.

RUPTURED ABDOMINAL ANEURYSM

An aneurysm is the abnormal bulging of an artery. Aneurysms most commonly occur in the aorta although they may present in any part of the body—brain, intestine, and so on. The defect in the wall of the artery may be caused by atherosclerosis, hypertension, and trauma, or it may be congenital. This condition is worrisome because many people who have aneurysms are asymptomatic until the aneurysm enlarges and is at risk of rupturing.

A ruptured abdominal aneurysm is a medical emergency. Individuals 55 to 60 years of age and older with multiple risk factors (aneurysm >6 cm, uncontrolled blood pressure, smoker, female gender) are more likely to experience rupture. The danger involved is when individuals are asymptomatic when diagnosed. Most of the time these individuals may continue to experience little to no symptoms (up to 75%) associated with the enlarging vessel. Continual expansion will result in rupture, exsanguinations, and death. Treatment of a ruptured abdominal aneurysm is surgical intervention, taking into account the risks and benefits of the particular patient.

THORACIC ANEURYSM

Twenty-five percent of aneurysms occur in the thoracic area. The wall of the aorta in the chest cavity is usually weakened by chronic, uncontrolled high blood pressure although conditions such as Marfan syndrome, smoking, Takayasu arteritis, and syphilis have also been associated with thoracic aneurysms. Imaging modalities useful for diagnosis include x-rays, ultrasound, CT, and MRI. Treatment of thoracic aneurysms is surgical and may include stent grafting.

ANEMIA

Anemia has many causes and is a symptom that increases with age. The World Health Organization has set normal hemoglobin ranges for men and women (lower limit of 12.5 g/dL). Problems with blood loss, blood hemolysis, or diminished production cause a person to become anemic.

ARRHYTHMIAS

Arrhythmias may cause the heart to pump blood less effectively by altering the duration and/or force of the contractions. The ventricles may also not fill completely, leading to suboptimal cardiac output.

Symptoms
- Dizziness ++++
- Feeling faint
- Fatigue

Signs
- Syncope
- Hypotension
- Palpitations

Workup
- Differentiate types of arrhythmias
- ECG
- Stress test
- Electrophysiologic studies (EPS)—Invasive procedure to locate the origin of the arrhythmia via insertion of a catheter
- Holter monitor

Comments and Treatment Considerations (Depending on the Clinical Situation)
- Therapeutic lifestyle modifications
- Medications
- Pacemaker
- Implantable defibrillator
- Ablation—Via catheter
- Surgery—Surgical ablation, more invasive and usually a last resort

THROMBOSIS OR EMBOLISM

Thrombosis, usually referred to in the context of DVT, indicates the presence of a blood clot in a vein. The clot impedes blood flow and may break off (embolize) and lodge in different areas of the body.

Symptoms
- Swelling, pain, tenderness in affected extremity
- Chest pain (embolism)
- Shortness of breath (embolism)

Signs
- Warmth in extremity that is swollen and erythematous
- Color changes in affected leg or extremity

Workup
- Blood work—Including D-dimer
- Ultrasound
- Venography

Comments and Treatment Considerations
- Anticoagulant medication—Warfarin/heparin
- Thrombolytics—To be used in emergencies
- Vena cava filter—Used to filter out blood clots prior to traveling to lungs to prevent pulmonary embolus

MYOCARDIAL INFARCTION

Large MI may lead to hypoperfusion and dizziness.
See Chapter 12, Chest Pain.

CARDIAC CAUSES

Decreased blood flow to the brain causes dizziness that is from a cardiac abnormality. Coronary artery disease (uncontrolled and overcontrolled), blood pressure, and arrhythmias may impede blood perfusion. Coronary artery disease is a condition involving atherosclerosis and arteriosclerosis. Blood pressure abnormalities contribute to CAD because of the effects it has on the arteries. Dysrhythmias are irregular heartbeats cause by some disruption in the electrical activity of the heart.

MEDICATIONS

A wide array of prescription and nonprescription medications may cause symptoms of dizziness. This potential side effect may exert a greater effect on the individual depending on metabolism, body weight or size, dosage of medication, and duration of use. A variety of nonspecific vestibulopathies and related drug-induced ototoxicity may cause an individual to experience a sensation of imbalance, hearing loss, or both. Listed are some of the more common ototoxic agents.

- Aminoglycosides are a class of antibiotics that include streptomycin, gentamicin, and tobramycin. The medications may damage the inner ear permanently and result in imbalance. The medications may also affect vision causing oscillopsia, the perception that objects are swinging.
- Aspirin has potential side effects that may cause tinnitus (ringing in the ears) and problems with balance. Usually the side effects are temporary and resolve when aspirin is stopped.
- Loop diuretics, such as furosemide, may also cause ototoxicity and dizziness that is often reversible.
- Cisplatin is a chemotherapeutic agent that may affect balance and hearing in much the same fashion as aminoglycosides.

VERTIGO

ARTERIOSCLEROTIC VASCULAR DISEASE

Cerebrovascular accident (CVA) generally presents with focal weakness. Occasionally some cerebrovascular disorders may present with dizziness (vertigo), with stroke and transient ischemic attacks. Interrupted perfusion in the posterior circulation may lead to dizziness, and vascular disease should be suspected in these patients. Atherosclerosis, thrombosis, embolism, and aneurysms are types of disease that must be considered.

POSITIONAL VERTIGO

Vertigo describes a sensation of motion experienced by the patient (self-motion) or the environment. Terms include "spinning," "whirling," or a sensation that the room (your surroundings) is moving. The most frequent cause of vertigo is benign paroxysmal positional vertigo (BPPV). Proposed theories note the imbalance in the vestibular system are due to canalithiasis (canal rocks) that are mobile densities in the semicircular canals that impede or redirect fluid, thus creating symptoms of vertigo. Patients may have a difficult time describing their symptoms. Peripheral causes of vertigo must be distinguished from central causes. In general, peripheral causes are extremely symptomatic with minimal change in head position. Some causes of peripheral vertigo include ear infections, benign positional vertigo, Meniere's disease, and labyrinthitis. Central causes occur in older patients and may be more subtle and be associated with other neurologic findings. In obtaining a history keep these things in mind to help differentiate among other type of dizziness: A description of dizziness with movement is too general and may be due to BPPV or postural presyncope, and head position changes without alterations in blood pressure (i.e., rolling over in bed, looking up, lying down) indicate positional vertigo.

Symptoms

- Dizziness, usually abrupt onset
- Nausea and vomiting with head movement
- Imbalance
- Blurred vision

Signs

- Nystagmus (rotatory—top pole toward affected side)
- Unsteady gait
- Worsening of symptoms with head movement—Patients with vertigo will be still and usually reluctant to move the head

Workup

- The Dix-Hallpike maneuver can be used to diagnose positional vertigo. The patient is moved from a sitting position to a supine position. In the supine position the patient's head is turned 45 degrees to one side and the head is bent backward 20 degrees off the table. Dizzy symptoms and eye movements are then assessed. Vertigo will present within 5 to 10 seconds and nystagmus will be observed in 30 seconds if BPPV is present. This test can differentiate the origin of a patient's vertigo. Central vertigo is caused by a problem in the brain whereas peripheral vertigo is caused by a problem in the ear. A positive Dix-Hallpike maneuver can distinguish which ear is affected.
- No laboratory tests directly confirm the presence of BPPV.

- No specific imaging exists for diagnosing BPPV. Abnormalities in the physical examination should be addressed via MRI to rule out other sources of inner ear pathology if necessary.
- Electronystagmography (ENG) may be used to better assess nystagmus.

Comments and Treatment Considerations

Brandt-Daroff exercise—A patient is initially sitting and then quickly leans to the side which worsens symptoms. The patient ends up lying on their side with that ear down. The patient remains in this position until the vertigo resolves. This is repeated approximately 20 times and done twice a day.

The Epley maneuver—With the patient in the sitting position the physician quickly lays the patient down with the head hanging off the table. The head is rapidly turned to the affected side. The physician then turns the head to the other side and then to the neutral position (ear parallel to the floor). The patient is then returned to the seated position and remains upright for the next 24 hours.

The Semont maneuver—With the patient seated the physician turns the patient's head 45 degrees horizontally to the unaffected ear. The head is then tilted 105 degrees so that the patient is lying on the side of the affected ear, head hanging and nose up. This position is held for 3 minutes, then the physician, while holding the head in place, rapidly moves the patient through a seated position ending when the patient is lying on the side of the affected ear, nose pointed to the ground. This position is held for 3 minutes and then the patient is slowly returned to the seated position.

STROKE AND TRANSIENT ISCHEMIC ATTACK

In terms of peripheral vestibular conditions that cause dizziness, 6% may be attributed to strokes and TIAs. Both stroke and TIAs involve an interruption of blood flow to brain tissue. The difference between the two is in the duration of ischemia.

TIA symptoms usually occur suddenly and resolve within an hour, although they may persist for up to 24 hours. Symptoms of a stroke and TIA are similar, and because of this one should always assume an acute stoke is occurring and should be evaluated as soon as possible. Narrowing of the vessels leading to or located within the brain is the cause of strokes and TIAs.

Other vessels in the vicinity of the occlusion may be able to compensate for the reduced or occluded blood perfusion; however, time is of the essence. Tissue that is oxygen deprived for only a few minutes may recover, but brain tissue starved of blood and oxygen that dies will not regenerate. There are two main types of stroke: ischemic and hemorrhagic.

ISCHEMIC STROKE

Ischemic stroke accounts for the majority of strokes. Brain cells are deprived of oxygen and blood and as a result die. The cause of this ischemia may be from a thrombus, an accumulation of plaque within the vessels commonly seen in those with atherosclerosis. Ischemia may also result from an embolus, a blot clot that has dislodged and is trapped in a narrow portion of the vessel. In people with atrial fibrillation (irregular beating of the heart) embolus is of concern.

HEMORRHAGIC STROKE

Hemorrhagic stroke constitutes approximately 20% of strokes. In this case there is bleeding within the skull, usually from uncontrolled hypertension, aneurysms, or congenital malformations of the vessels, such as arteriovenous malformation (AVM).

Symptoms

- General symptoms can include numbness or weakness, dizziness, or nausea.
- In the majority of patients it depends on location of stroke
  - Lacunar infarct: Contralateral motor and sensory deficit, ipsilateral ataxia, and dysarthria.
  - Anterior cerebral artery: Contralateral leg weakness and sensory deficit, confusion, incontinence
  - Middle cerebral artery: Contralateral hemiplegia, hemisensory loss, homonymous hemianopia, and aphasia. Involvement of posterior branch of middle cerebral artery may cause Wernicke's aphasia.
  - Posterior cerebral artery: Contralateral hemisensory disturbance, macular sparing homonymous hemianopia
  - Vertebral artery: May be asymptomatic due to circulation from other artery. With occlusion of small arteries symptoms such as contralateral hemiplegia and sensory deficit corresponding to ipsilateral cranial nerve
  - Posteroinferior cerebellar artery: Ipsilateral cranial nerve (CN) IX and X lesions, ataxia, Horner syndrome, contralateral spinothalamic sensory loss of limbs

Signs

- Depends on location (see previous)
- Dysarthria
- Dysphagia
- Ataxia
- Ptosis
- Facial droop

Workup
- History and physical examination—Assess risk factors (blood pressure, cholesterol, diabetes)
- Ultrasound of carotids
- CT scans—Used to assess if hemorrhage is present
- MRI—Used to assess area of ischemia

Comments and Treatment Considerations
The risk of stroke increases with patients who have had a TIA. Therefore, the focus of treatment should be to reduce the risk of a stroke via maintaining appropriate blood pressure, controlling cholesterol, managing diabetes, instituting lifestyle changes such as eating healthy, maintaining weight, exercising, smoking cessation, and taking low-dose aspirin or anticoagulants if appropriate.

Individuals should not wait to see if their symptoms resolve because there is no way to differentiate an acute stroke from a TIA. Prompt medical evaluation is absolutely necessary. Specific treatment depends on the type of stroke diagnosed.

Ischemic strokes hinder on correcting the underlying obstruction and restoring blood flow to the brain. Thrombolytics (clot-busting drugs such as tissue plasminogen activator) may be administered within 3 hours. Contraindications include neoplasm, active bleeding, aneurysm, arteriovenous malformations (AVMs), uncontrolled BP, aortic dissection, CVA less than 2 months ago, and allergy to thrombolytics. Procedures including endarterectomy or angioplasty, and stent placement may be used to recannulate the narrowed vessel.

Hemorrhagic strokes, mainly caused by aneurysms or AVMs, may be surgically corrected. Aneurysm clipping places a clamp at the base of the aneurysm in an attempt to keep the aneurysm from bursting or prevent rebleeding. Removal of an AVM depends on size and location. In case an AVM is not able to be removed, focused radiation or embolization interrupts blood supply to the AVM, causing it to decrease in size.

ANXIETY

Psychogenic dizziness refers to any psychologic disorder that causes imbalance or dizziness. The most notable cause of this problem are anxiety disorders, including but not limited to phobias, panic attacks, and chronic anxiety.

Symptoms
- Varied, numerous nonspecific complaints ++++
- Feeling faint
- Dizzy

Signs
- Tachycardia
- Diaphoresis
- Anxious mood ++++
- Syncope

Workup

- History and physical examination—Physical examination to evaluate balance, gait, function
- Psychologic questionnaires, if appropriate

Comments and Treatment Considerations

- Cognitive-behavioral therapy
- Medications (anxiolytics or antidepressants), if applicable
- Referral and evaluation by a psychiatrist

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